Agile Mind, Inc.

IES SBIR AWARD:
2008: Phase I, $100,000; 2009: Phase II, $750,000

KEY INFORMATION:
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Product Demo: http://www.agilemind.com/AMDemo/ProductDemo.html
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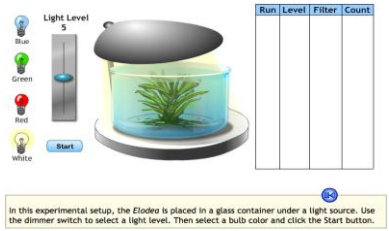
PROJECT TITLE: Agile Mind Visualizations

PRODUCT: Agile Mind's core product— a comprehensive on-line system—supports student engagement and achievement in middle- and high-school mathematics and science. With IES SBIR funding, Agile Mind developed 30 web-based visualizations to embed in the biology modules of its core product. The interactive and animated visualizations address concepts central to state and national standards. Key features of the visualizations include: (a) elements a user manipulates (start/pause/repeat buttons, sliders, drag-able pieces, variables to adjust); (b) imagery that explicitly makes real-world connections to key content; (c) multiple representations to support deeper understanding of concepts (graphical depictions, caption narratives, tables of data from observed phenomena); and (d) automated and customized feedback from the software to student to support learning. The visualizations provide opportunities for discovery-based learning of real-world examples that ordinarily would not be possible in classroom settings.

DEVELOPMENT: The animations and simulations in the visualizations were iteratively developed by Agile Mind with feedback from education experts, teachers, and students. Development began with a storyboard, which was then converted into functional specs for the animation by an instructional designer. After review by beta testers, animators and programmers created art for the storyboard, bringing to life the pedagogical intent of the authors. The pieces were checked again to ensure accuracy and functionality. The final visualizations were incorporated into Agile Mind Biology, where the visualizations are viewed and played as part of the course content. An animation player automatically captures information about how students interact with the visualizations. These data are used by the developers to continually refine and improve the visualizations.



RESEARCH: A mixed-methods study included a sample of convenience of 19 teachers and 312 9th and 10th grade students from 8 schools in 2 states. All students in this study received the intervention as a supplement to regular instruction for 3 to 4 months. The study examined feasibility and usability, and potential of the visualizations to support student engagement and learning of biology content. Other key research questions addressed visualization design features, amount and context of use, and the utilization of various instructional strategies. Results demonstrated that students were more engaged in content that was supplemented by visualizations than content that did not have an accompanying visualization, and that students who used the visualizations for longer periods of time had greater self-reported understanding of science concepts than students who used the visualizations less. Results also revealed that the visualizations may be most effective when integrated within challenging standards-centered lessons to facilitate inquiry learning that would otherwise have not been possible. Further research to test the efficacy of the visualizations to improve student learning is being planned.

PATH TO COMMERCIALIZATION: Founded in 2002, Agile Mind is a technology company dedicated to broadening student access, achievement, and persistence in challenging, contemporary mathematics and science courses, and to fostering exemplary, sustainable teaching practices. The visualizations developed through IES SBIR funds and the 250 additional visualizations developed after the project ended (and are based on the IES-funded R&D) have been commercialized along with the direct licenses of the Biology course program to schools and districts in 9 states. At present, these visualizations have been used by thousands of educators and more than 90,000 students. Fees from education entities licensing Agile Mind programs and services (including Biology visualizations) provide 85% of the company's operating capital.